Name: Date:

Polynomial Factoring solution (version 613)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 4x + 19 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(19)}}{2(1)}$$

$$x = \frac{-(-4) \pm \sqrt{16 - 76}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-60}}{2}$$

$$x = \frac{4 \pm \sqrt{-4 \cdot 15}}{2}$$

$$x = \frac{4 \pm 2\sqrt{15}\, i}{2}$$

$$x = 2 \pm \sqrt{15}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $4 - 8i$ and $-2 + 7i$ in standard form $(a + bi)$.**

Solution

$$(4 - 8i) \cdot (-2 + 7i)$$

$$-8 + 28i + 16i - 56i^2$$

$$-8 + 28i + 16i + 56$$

$$-8 + 56 + 28i + 16i$$

$$48 + 44i$$

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3. **Write function $f(x) = x^3 - 7x^2 - 6x + 72$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	-7	-6	72
4		4	-12	-72
	1	-3	-18	0

$$f(x) = (x-4)(x^2 - 3x - 18)$$

$$f(x) = (x-4)(x-6)(x+3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+6) \cdot (x+2)^2 \cdot (x-1) \cdot (x-6)$$

Sketch a graph of polynomial $y = p(x)$.